

- ◆ 5:05 ~ 5:20 Welcome
- ◆ 5:20 ~ 5:55 Advisor  
Introductions/What do you want to do ?
- ◆ 5:55 ~ 6:00 Break
- ◆ 6:00 ~ 6:10 Discussion on  
Engineering as a Career
- ◆ 6:10 ~ 7:00 Student  
Introductions/Mixers, Survey, etc ..

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### Advisor Contact Sheet

◆ **Sam Lee, Ph.D.**

- Research Engineer
- (216) 433-5296
- Sam.Lee-1@nasa.gov

◆ **Jinho Lee, Ph.D.**

- Research Engineer
- (216) 433-5877
- Jinho.Lee-1@nasa.gov

◆ **Stephanie D. Brown-Houston**

- 216-433-8006
- sdbrown-houston@nasa.gov

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## Jinho Lee (Gin-Ho)

- ◆ **Education -**
  - Graduate of New York City Public School System.
  - B.S. and PhD Aero Engineering, State University of New York at Buffalo.
- ◆ **Specialized Job Assignment - Computational Specialist for the Combustion Branch of Turbomachinery and Propulsions System Division.**
  - CFD code development/Validation of Hypersonic Technology development
  - Principal Combustion Engineer for NASA's RBCC and TBCC programs
- ◆ **Hobbies and Interests - High Speed flight, Model Airplanes, Playing with family and computers.**



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## Sam Lee

- ◆ **Education**
  - B.S. Mechanical Engineering – Cornell University (1994)
  - M.S. & Ph.D. Aerospace Engineering – University of Illinois (1997, 2001)
- ◆ **Job Assignment**
  - Research engineer for Aircraft Icing Branch
  - Worked at NASA for 6 years
  - Experimental studies on effects of in-flight icing on aircraft aerodynamics
  - Wind tunnel and flight testing
- ◆ **Hobbies & Interests**
  - Photography, movies, video game, basketball



Cornell University  
College of Engineering



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## Explorer Post 630 2009/10 Aeronautics Post



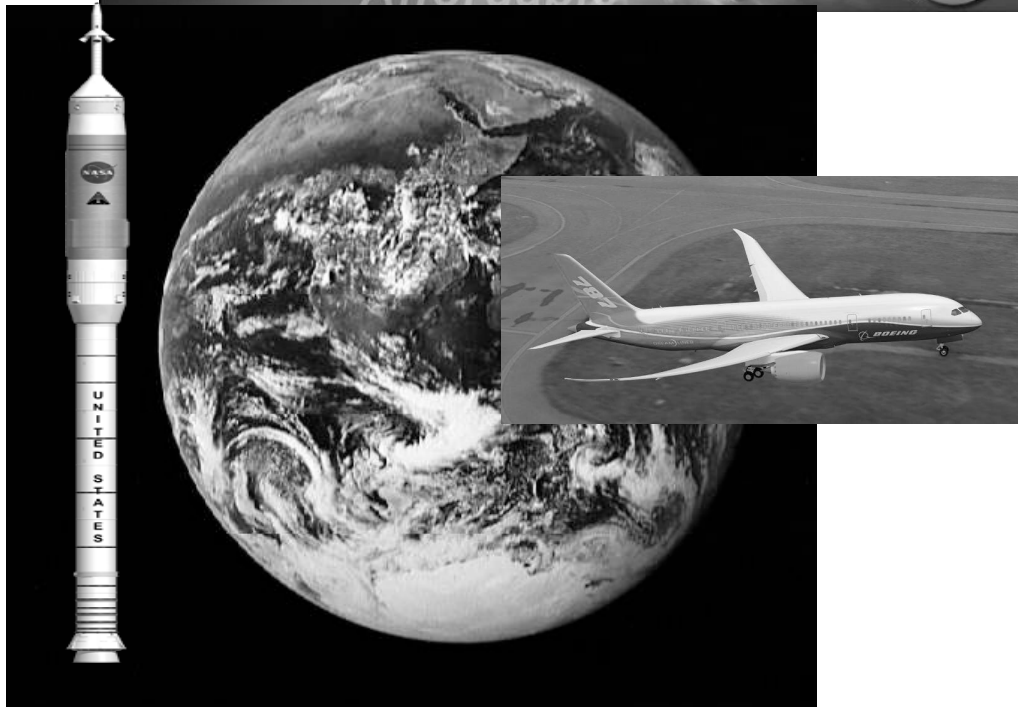
### Outline

- ◆ Ground Rule/Background Information
- ◆ Get to know each other
- ◆ Question: What does an engineers do during the day?
- ◆ What we will do for the year- What we did in the past
- ◆ Question: How much does an engineer make?

## What is Exploring?

- ◆ We (advisors) are here to share with you (Scouts) our NASA experiences.
- ◆ *This is not a class!*
- ◆ This is a chance for you find out what is behind the fence.
- ◆ This is also chance to find out for yourself that your 'current and future' academic endeavor will payoff.
- ◆ You have to help us by engaging in conversation with us
- ◆ Need to keep a couple of Saturdays too!

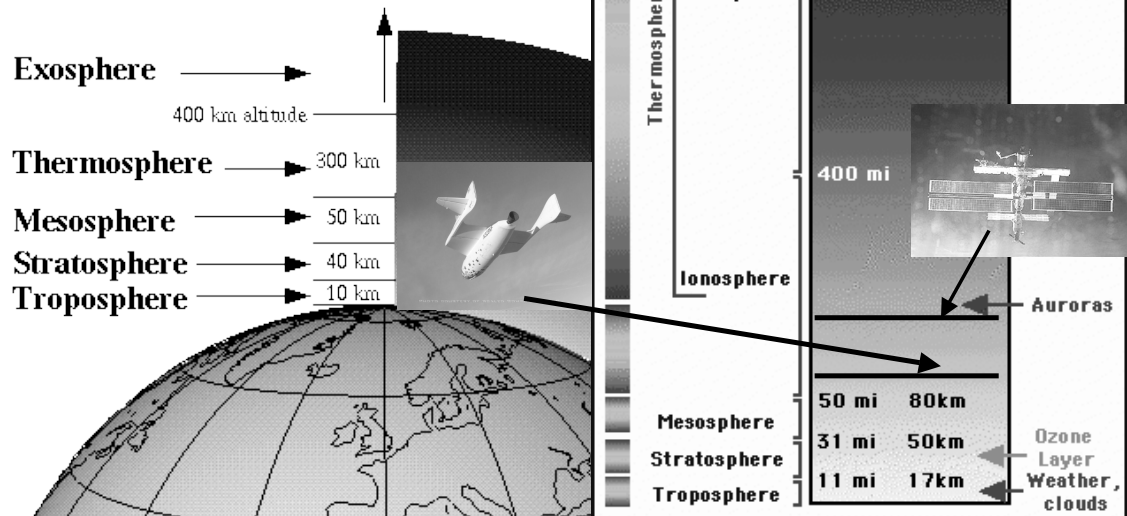
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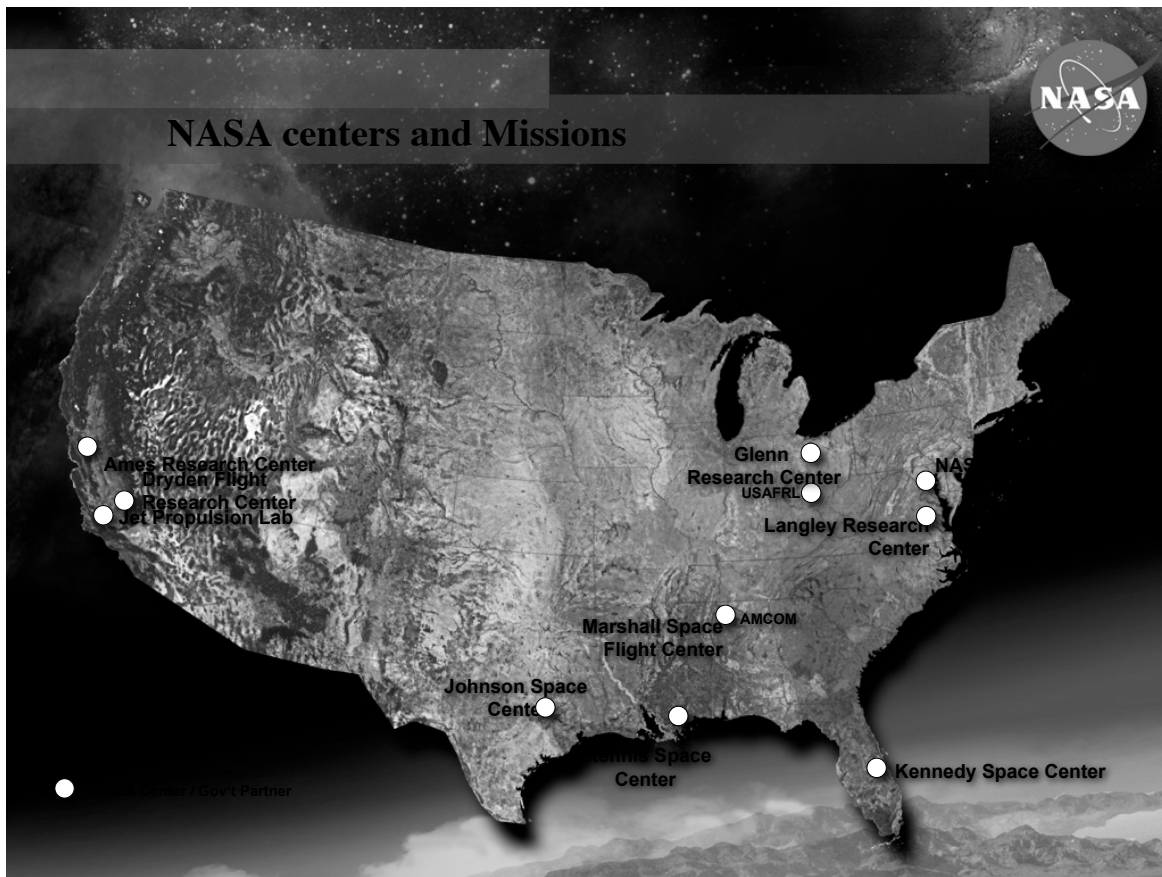
## Anatomy of Atmosphere



**Exploring**

Safe  
Reliable  
Affordable





**Exploring**

Safe  
Reliable  
Affordable



# NASA Glenn RC



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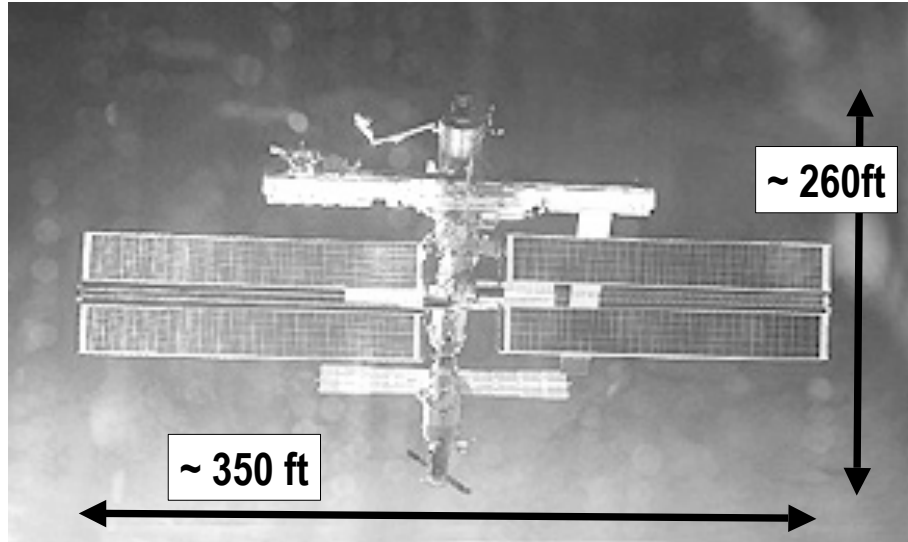
**Exploring**

Safe  
Reliable  
Affordable



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◆ Space Station (Largest Science Lab? )



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Engineers design stuff  
to make our live  
better!

Today- many different  
types of engineers

Engineers drive trains?

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## Combustion Branch

21 Scientists and Engineers

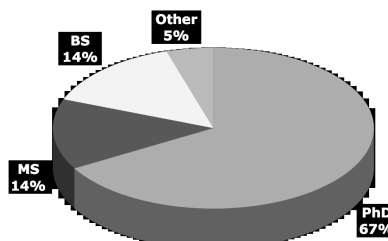
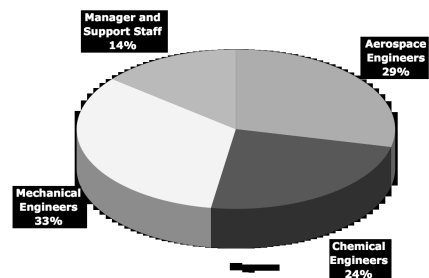
6 Aerospace Engineering

5 Chemical Engineering

7 Mechanical Engineering

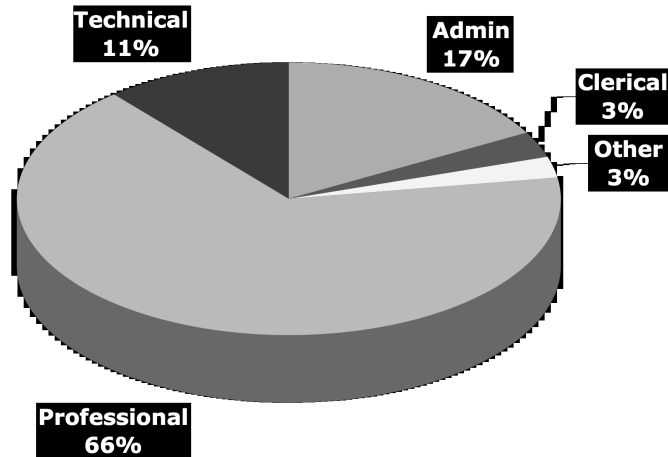
2 Management (both former  
engineers)

1 Administrative Support



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## NASA Glenn Research Center



GRC 1631 employee

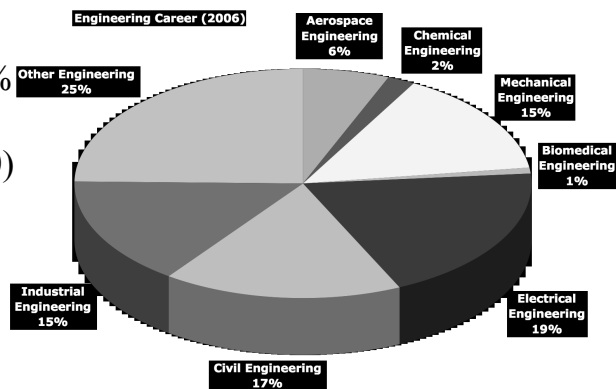
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## Engineering Future

Projection to 2016 based on 2006

Labor data: (Growth per area)

Engineering : (1,500,000) +11 %

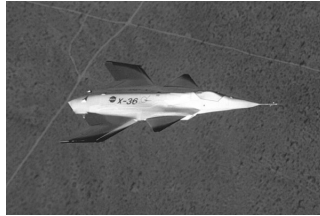
Aerospace Engineering : (90,000)  
+10 %Chemical Engineering: (30,000)  
+8%Mechanical Engineering:(220,000)  
+ 4%

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## What is Aerospace?

There are two primary divisions within Aerospace

- ◆ **Aeronautics:** Focuses on systems that operate in the Earth's atmosphere



- ◆ **Astronautics:** Focuses on systems that operate in space



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## Aeronautics

- ◆ **Aeronautics:**  
Design, development, analysis, testing, and production of **aircraft** for both military and civilian markets.
- ◆ Private companies and government agencies:
  - Mainly aerospace, mechanical, structural, and electrical engineers
  - Also other type of engineers, scientists, and technicians from a variety of specialties.
- ◆ Specific disciplines:  
**Aerodynamics and fluid dynamics; propulsion, guidance, navigation and control, aircraft structures and materials, mechanical design, electronics systems and flight control, manufacturing and operations, communications; systems engineering; software engineering; and computer engineering.**



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## Principal Divisions in Aeronautics

Military aircraft (70% of total aircraft sales)



Civilian aircraft (30% of total aircraft sales)

Aircraft engines



Missile systems (33% of total rocket sales)

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## Astronautics

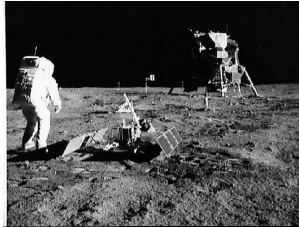
- ◆ Astronautics:  
**Design, development, analysis, testing, and production of rockets, spacecraft, and global space systems.**
- ◆ Private companies and government agencies:  
**Engineers, scientists, and technicians from many specialties.**
- ◆ Specific disciplines:  
**Aerodynamics and fluid dynamics; propulsion, guidance, navigation and control; spacecraft and rocket structures and materials; mechanical design; electronics systems and flight control; reentry physics and technology; space processing, manufacturing and operations; human and environmental factors in design communications; systems engineering; software engineering; and computer engineering.**



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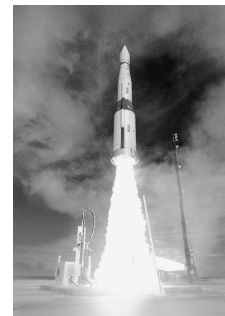
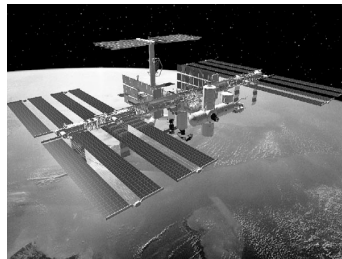


## Principal Divisions in Astronautics



Launch vehicles (66% of total rocket sales)

Global space systems (national and multi-national)



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## Typical Educational Scenario

- ◆ BS (minimum) 4-5 years
- ◆ MS (recommended) 1-2 "
- ◆ PhD (think about it) 4-6 "

### Areas of Specialization

- ◆ Aerodynamics - The study of fluid motion around a body moving through the atmosphere at speeds that range from subsonic to hypersonic.
- ◆ Dynamics & Control - The study of techniques for aerospace vehicle guidance and the analysis of flight vehicle trajectories, orbits, and dynamic motion.
- ◆ Propulsion - The study of basic principles of propulsion and the application of gas dynamics to internal flows.
- ◆ Structures - The study of the principles of mechanics and analysis techniques necessary to ensure structural integrity of a vehicle, primarily an aircraft or spacecraft.

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## 15 top-earning degrees

1	Petroleum engineering	\$83,121
2	Chemical engineering	\$64,902
3	Mining engineering	\$64,404
4	Computer engineering	\$61,738
5	Computer science	\$61,407
6	Electrical engineering	\$60,125
7	Mechanical engineering	\$58,766
8	Industrial engineering	\$58,358

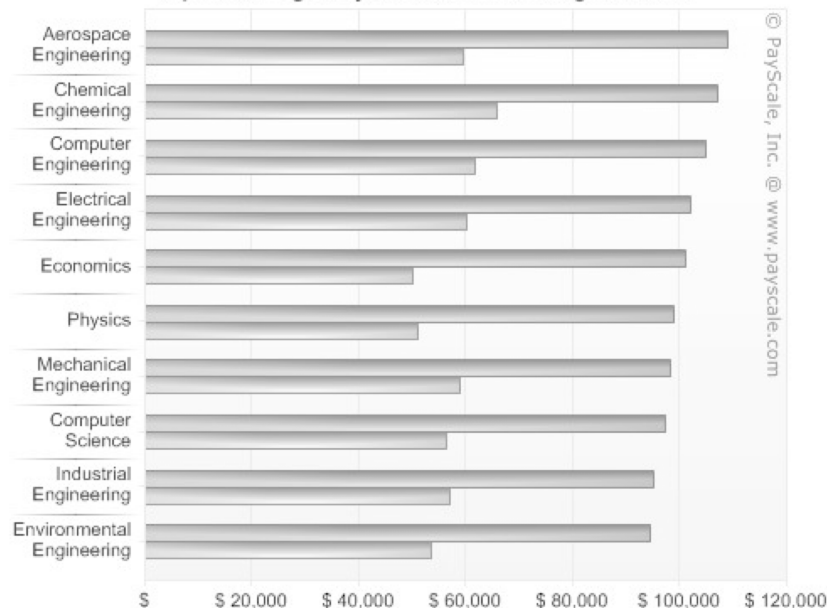
9	Systems engineering	\$57,438
10	Engineering technology	\$56,447
11	Actuarial science	\$56,320
12	Aeronautical engineering	\$56,311
13	Agricultural engineering	\$54,352
14	Biomedical engineering	\$54,158
15	Construction management	\$53,199

NATIONAL ASSOCIATION OF COLLEGES AND EMPLOYERS

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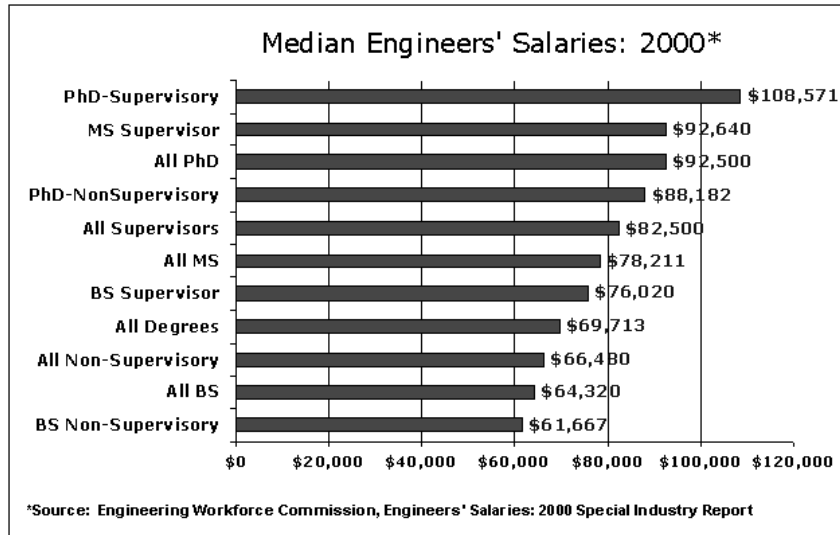


## Top 10 College Majors That Lead to High Salaries



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## Supervisory Salaries by Degree

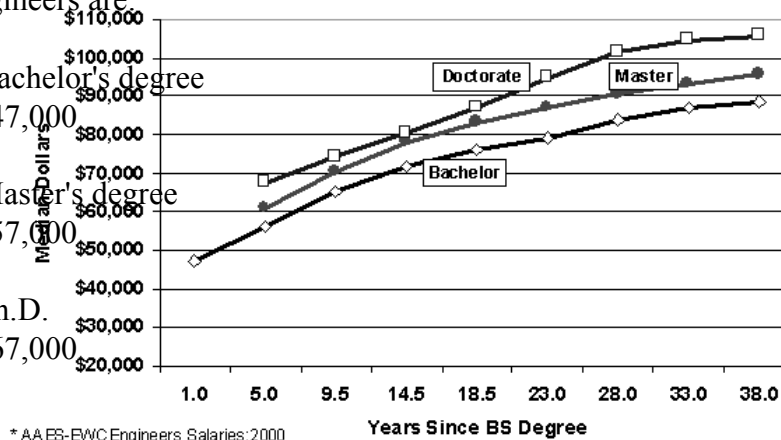


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## Salary Information by Degree

According to a 2000 salary survey, the median starting salaries for engineers are:

- Bachelor's degree  
\$47,000
- Master's degree  
\$57,000
- Ph.D.  
\$67,000



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